

ABSTRACT OF THE DISCLOSURE

An optical beam shaping element is used to produce a beam of high brightness from a diode bar or a single emitter diode, allowing for efficient coupling of the beam into an optical fiber. An embodiment of the beam shaping element allows the construction of a quasi-monolithic or truly monolithic beam shaper incorporating both fast axis collimation as well as beam rotation. Additional slow axis collimation or collimation of the beam-rotated fast axes of the individual emitting elements of the diode bar is also possible in one quasi-monolithic or truly monolithic design. The beam rotation element comprises an array of beam-inverting planar grin lenses aligned with their axes of equal refractive index at an angle of $\pm 45^\circ$ with respect to the slow axes of the emitters. Alternative embodiments comprise beam rotation elements based on two planar grin lens arrays, arrays of uniaxial grin lenses, arrays of uniaxial focusing reflective optic or arrays of cylindrical Fresnel lenses. The beam shaping element can be used in conjunction with stacks of diode bars or alternatively optical beams of ultra-high power can be generated by combining multiple fiber coupled diode bars in a fiber bundle incorporating metallization and a heat sink.